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ABSTRACT

Previous research has shown that students often overestimate their performance levels on course examinations. A model of motivation was applied to an individual's predictions and postdictions of his/her own performance levels in course examinations to obtain actual predictions and postdictions for 111 college students over a period of three academic years. Data analysis indicated that a quantitative model of students' performances and judgments based on the attribution theory of motivation was able to interpret and estimate performance levels, using only three factors of effort, test difficulty, and luck. The use of the attribution model in the actual classroom environment provided an opportunity to incorporate attribution theory into classroom discussions. The use of multiple regression equations provided the instructor with information about the relative importance of various factors to the student. The research investigation is unique in that it allowed observations to be made of the judgmental processes using both a longitudinal (academic year) and a cross-sectional (three different classes) approach. (Author/JAC)

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Attribution of Performance Levels by Students on Introductory Psychology Examinations

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Running head: Attribution of Performance Levels on Examinations

Attribution of Performance Levels by Students on Introductory Psychology Examinations

Previous research reported by Murray (1980) on the estimation of performance levels by students in introductory psychology showed that students often overestimated their performance levels on course examinations. In this study students were asked to predict and postdict their scores on a 20-item, five alternative multiple-choice test based on the completion of chapters in their textbook. As expected, postdiction was better than prediction of performance levels. In addition, students who performed at a higher level on the quizzes estimated their performance levels better than those who performed at a lower level. A possible explanation offered for these findings was suggested by the attribution model of motivation proposed by Weiner and his associates (Weiner, Frieze, Kukla, Reed, and Rosenbaum, 1972). This model proposed "that individuals use four elements of ascription both to postdict (interpret) and to predict the outcome (O) of an achievement-related event. The four causal elements are ability (A), effort (E), task difficulty (T), and luck (L): $O=f(A,E,T,L)$. In attempting to explain the prior outcome (success or failure) of an achievement-related event, the individual assesses his own ability level, the amount of effort that was expended, the difficulty of the task, and the magnitude and direction of experienced luck." (p.96)

The purpose of the present paper was to apply this model of motivation to individual's predictions and postdictions of their own performance levels in course examinations. The assignment of weights to the causal factors in this model by the students provides a further test of the generalization of this model in a context of important personal involvement to the individual. From

the assignments of weights to the various factors in the model, a multiple regression equation could be used by the investigator to make predictions of future judgments and performance levels of the students on subsequent tests. In addition, the process of judging performance levels over a substantial period of time (in this case, an academic year) should provide the student of introductory psychology with important information about her ability to evaluate her own achievement levels in a relatively unchanging test-taking environment.

Method

Subjects

The subjects for this investigation were undergraduate female students enrolled in introductory psychology courses for the academic years 1979-80, 1980-81, and 1981-82. A total of 111 students participated: 36 in 1979-80, 37 in 1980-81 and 38 in 1981-82.

Procedure

For each semester, three 50-point tests and a 100-point final examination were administered to each student. The format of these tests consisted of the following items: 10-12% of the items were multiple-choice, 10% matching, 5-7% fill-ins, 5-8% identifications, and 20% essay questions. The percentages of the different types of items was relatively constant for all examinations, except when statistical procedures were discussed, and a problem section of approximately 10% of the total score was included.

At the administration of each test the instructor passed along with the test a separate sheet containing information about the types of judgments the students were asked to make. On this paper students were told to "take a few minutes to look over the test and estimate to the best of their ability the number of points that they think they will make on this test." They were also

asked to indicate on the 100-point scale below their estimate (prediction) their confidence in their judgment, and on two additional 100-point scales their judgments of the test difficulty and their effort in studying for the test. After completing the test, each student was then asked "to look over the test and again estimate the number of points they think they will get on the test." They were asked again to complete the confidence scale on their estimate (postdiction), and the amount of luck involved in their estimate of their score. All tests were graded independently of the students judgments. These judgments were collected and recorded by the instructor's assistant, and he was kept ignorant of all data collected until the end of the academic year when the data were analyzed.

At the end of the academic year, all students were informed of the purpose of the study, and the results were incorporated into the classroom discussion of attribution theory. This topic was always covered at the end of the Spring semester.

For data analysis the following information was obtained for each test: A prediction and postdiction with corresponding confidence measures, an objective measure of the student's achievement level on the test, and each student's judgment of the importance of the causal factors (effort, test difficulty, and luck) for the Weiner model. The fourth factor, ability, was not used in the data analysis, but could be estimated, if needed, from the student's performances on the tests.

Results and Discussion

For each test, three multiple regression equations were computed. One on students' predictions based on their assignment of values on the 100-point scale

to effort, test difficulty, and luck. Two other regression equations were computed for test scores and postdictions using the same variables. In this way a total of 18 regression equations could be obtained for each academic year. Data analysis for the three academic years indicated that a quantitative model of students' performance and judgments on introductory psychology examinations is possible with the use of only three factors--effort, test difficulty, and luck. In the present research context, it may be even possible to eliminate the causal factor luck, since it is seldom endorsed above 30 points on the 100-points scale, and the usual weight to this factor in the multiple regression equations is a very small negative value. An example of the multiple Rs based on these six tests for the academic year 1979-80 is as follows. The range of the Rs for prediction was .47 to .57, with a median R of .50. The range of multiple Rs for students' test scores was .45-.67 (median=.51), and for postdictions, .24-.61 (median=.51). Ten of the 18 regression equations were significantly different at $\alpha < .05$. One interesting observation is the relatively high correlation between the students' postdictions and their scores on the tests; these correlations ranged from .50 to .79, with a median correlation of .63. The range of correlations between predictions and postdictions was even greater, .50 to .85 (median=.72). At first appearance, it looked as if once a student had predicted her score on a test, the taking of the test had little influence on her postdiction of her score. This is curious, since one would also expect the correlation between predictions and test scores to be of the same magnitude as postdictions to test scores. This was not the case, since the range of coefficients was between .35 to .67 with a median value of .51; this was much lower than that between postdiction and test scores. Similar results were obtained for the other two academic years 1980-81 and 1981-82.

Additional analyses were performed comparing the difference-scores between students' predictions and postdictions with her test scores. These analyses provide information over time of the students' perception of the test-taking environment. One of the primary aims in carrying out this study was to provide the student with information about her judgments of her performance and her actual level of performance. One would expect, if some learning has occurred in this context, that these difference-scores would decrease over time. This is somewhat suggested by the data. Figure 1 shows the results of the difference-scores of the students' judgments for one academic year. Inspection of this figure reveals that for all tests, except for test 3 in the Spring semester,

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Insert Figure 1 about here

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the mean differences between postdictions and test scores was less than that of the mean differences in predictions and test scores. Analysis of variance for repeated measures on the two factors of tests and judgments were calculated, and significant differences among tests and the interaction between tests and judgments were obtained for one semester. These calculations were only performed on the data of students who had completed all the information for all six tests. This reduced the number of subjects for the two semesters to 27 and 24, respectively.

The use of the attribution model of motivation to the actual classroom environment of the student offers an excellent test of the model's ecological validity. It also provided a vehicle for incorporating into the classroom discussions when the general area of attribution was presented. Having participated in an actual study using a specific model of attribution provided a

"concrete" example of the theory for the students. In addition, the use of multiple regression equations provided the instructor with information about the relative importance of the various factors to the student. The extension of the multiple linear regression model into the classroom setting as was done in this study could provide valuable information about the students' perceptions of the instructional contents of the course. The present investigation was unique in that it allowed observations to be made of the judgmental processes using both a longitudinal approach (an academic year) and a cross-sectional approach (3 different classes). Finally, the investigation allowed the student, as subject, to learn in a meaningful way knowledge about her own judgmental processes vis-a-vis her own achievement levels.

References

Murray, F. S. Estimation of performance levels by students in introductory psychology. Teaching of Psychology, 1980, 7, 61-62.

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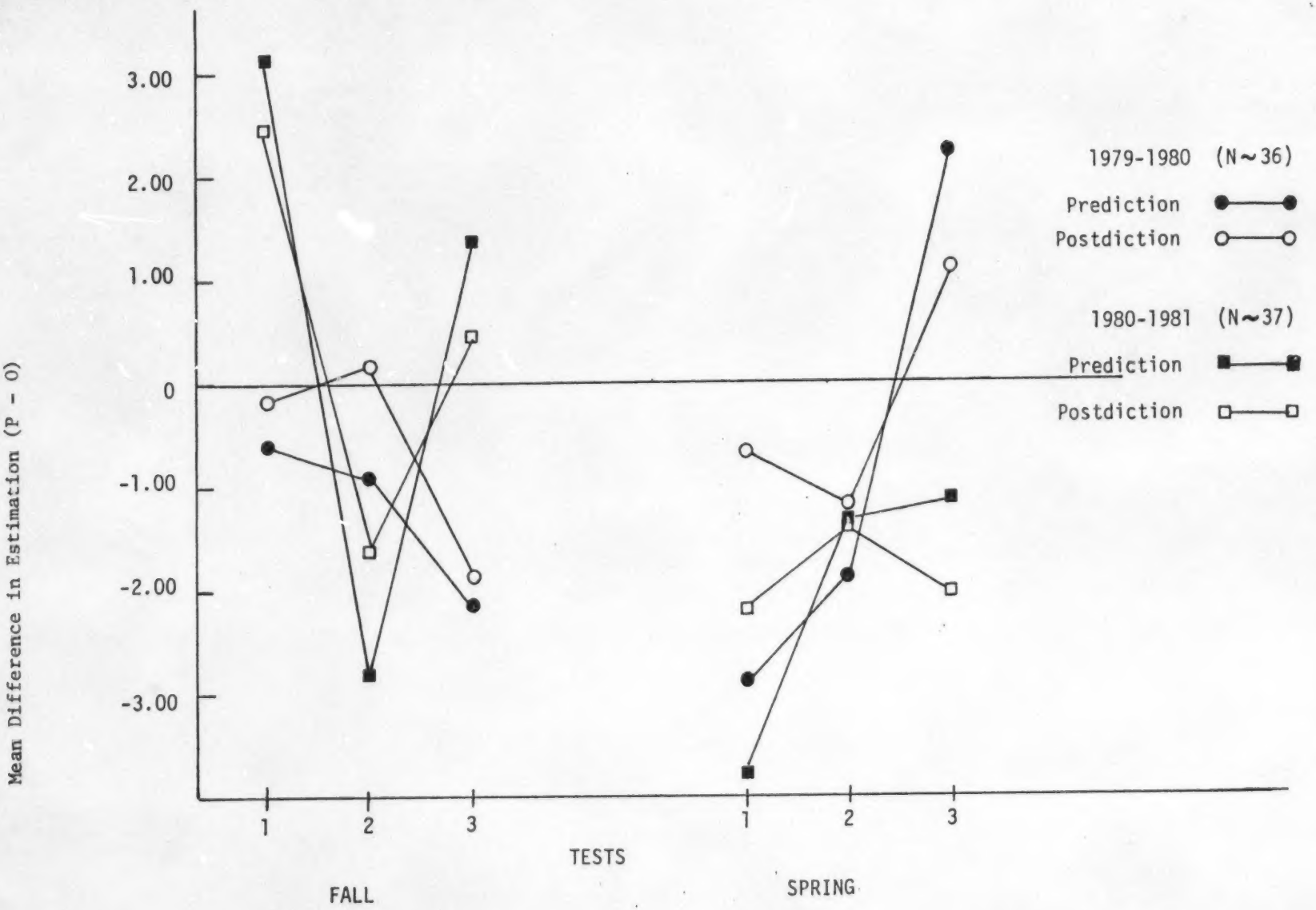
Footnotes

1. Request for reprints should be sent to Frank S. Murray, Department of Psychology, Randolph-Macon Woman's College, Lynchburg, Virginia 24503.

2. Parts of this paper was presented to the 53rd Eastern Psychological Association, Baltimore, Maryland, April 15, 1982.

Figure Caption

Figure 1. Mean differences in judgments of performance levels with actual performance levels for two academic years.


3.00
2.00
1.00
0
-1.00
-2.00
-3.00
Mean Difference in Estimation (P - O)
1
2
3
1
2
3
TESTS
FALL
SPRING
1979-1980 (N~36)
Prediction
Postdiction
1980-1981 (N~37)
Prediction
Postdiction